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## **Inventory Management Challenges For B2C E-Commerce Retailers**

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### **Abstract**

This research was conducted on B2C e-commerce companies or online retailers to study the challenges involved such as demand variations, reverse logistics, seasonal fluctuations, and stockless policy in inventory management and the risks such as lost sales, lost customers, low customer satisfaction associated with the same. This study also includes various strategies to mitigate the risk associated with inventory management of online retailers.

The study revealed that online retailers are poised with myriad of inventory management problems such as demand fluctuations, reverse logistics, stock outs, managing SKU's, keeping count of the inventory, multi channel shoppers, bottleneck and weak points, bullwhip effect and distressed stocks. To mitigate these risks online retailers adopted strategies such as dropship strategy, classification of inventory, hybrid strategy, pre-purchase stocks and stock less policy that is purchasing stocks after customer orders. The study also revealed that better inventory management plays an important role in enhancing customer satisfaction levels which in turn helps e-commerce companies in the long run.

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## 1. Introduction

The emergence of the internet has been the greatest technological advancement after the industrial age. From the recent studies on internet penetration and usage in India it has been concluded that many Indians are using the internet to pay bills, purchase products online apart from regular surfing, checking e-mail and socialising on multiple social networks. The number is expected to grow from time as the internet becomes more pervasive and secure. The rise of the internet has created opportunities for entrepreneurs, and has changed the business landscape of e-commerce.

Globalization has accelerated commerce, and the internet is the driving force for an inter-connected supply chain. E-commerce is a complex process that involves extreme synchronization between various entities. Consumers expects for an error-free supply chain, which increases the pressure of managing demand and supply incorporating lower inventory processes and lowers total costs for retailers.

Organizations that can achieve seamless, real-time supply chain integration will gain a competitive advantage over their competitors. To achieve real-time efficiency, e-commerce applications have to be multi-layered and full of rapid decision-making. Moreover, flexible systems that are high in service levels will achieve the full connectivity to the global supply chain.

Managing inventory to create higher inventory turnover and just in time delivery practices is one of the most important processes for online retailers. Flexible systems that respond to customer demand and inventory uncertainties are most important in e-commerce.

The scope of this thesis includes understanding the current inventory management practices for the B2C (Business to consumer) e-commerce retailers of Pune in India, outlining the challenges such as demand variations, reverse logistics, seasonal fluctuations, stockless policy and the risks such as lost sales, lost customers, low customer satisfaction associated with it. The scope also includes studying and suggesting various strategies to mitigate the risk associated with inventory management by analysis of the data gathered from primary and secondary research.

**AIM:** To study the challenges such as demand variations, reverse logistics, seasonal fluctuations, and stockless policy involved in inventory management of a B2C e-commerce business and how to mitigate the same to enhance the level of customer satisfaction by efficient inventory management.

## 2. Hypothesis

This particular hypothesis was based on the customer satisfaction level related to the delivery of products purchased online by them. The questions asked to them were to know their satisfaction level when the products to them were not delivered in time due to improper inventory management by online retailer. Other questions which were asked to them were to understand how inventory can be managed properly by online retailers to increase their satisfaction levels.

1. Better inventory management increases the customer satisfaction level

## 3. Review Of Related Literature

As per the study on “E-commerce and Inventory Management” by Rell Snyder of National University at Costa Mesa and Basel Hamdan of Argosy University in 2009, online retailers have to account for stock outs and act accordingly to not to lose sales or customers. Large retailers with an online and physical presence have the flexibility to serve customers better than smaller retailers.

As per the study carried out by Daewon Sun on Inventory Management in e-business he talks about an EOQ approach with compensation policy to manage the inventory for e-commerce business to find can the stockless policy be an optimal inventory policy for an online retailer.

As per the study conducted by Susan L. Golicic, Donna F. Davis, Teresa M. McCarthy and John T. Mentzer of The University of Tennessee, Knoxville, Tennessee, USA in 2001 to understand “The impact of e-commerce on supply chain relationships” - The e-commerce environment was perceived as highly uncertain, stemming from increased information visibility and dynamic market structures. A stronger emphasis on relationship management as part of business strategy enables managers to manage uncertainty better.

## 4. Methodology

Data for this study was gathered as primary and secondary data.

Primary data was gathered from a sample size of 200 respondents by means of questionnaire to gauge customer satisfaction levels related to delivery of products which are purchased online. Secondary data was collected by interacting with executives from e-commerce companies situated in Pune such as Yesgrid.com, Myntra and Zinnin.com and from various research papers, journals, newspapers, databases and internet.

## 5. Results And Analysis

### PRIMARY DATA RESULTS AND ANALYSIS

#### General Information of Respondents:

Most of the respondents were from the young age population category (18-25 & 26-30) of urban India which includes college going students and working executives. The other age group respondents were 31-40 and Above 40 years of age.

**Table 1: Love for online shopping**

<u>S.No.</u>	<u>Opinion</u>	<u>Number of respondents</u>	<u>Percentage (%)</u>
1.	Strongly Agree	54	27
2.	Agree	75	37.5
3.	Neutral	58	29
4.	Disagree	12	6
5.	Strongly Disagree	1	0.5

It was observed that young age population which includes college going students of urban India and working executives were more inclined towards shopping online. This may be because of the easy and low cost availability of internet facilities by service providers and the growth of e-commerce space in India which is gaining popularity by taking advantage of social media surge in India. In all age groups respondents mostly agreed with their love for online shopping except in the age group of Above 40. This can be attributed to their age where they were not much familiar with the use of computers and internet.

A B2C e-commerce should capitalise on these growing numbers of online shoppers and devise means in terms of easy availability of products purchased online and in time delivery of these products (possible by incorporating better inventory management techniques) to customers to retain and grow the number of customers.

**Table 2: Products which are shopped more**

<u>S. No</u>	<u>Category</u>	<u>Number of respondents</u>	<u>Percentage (%)</u>
1.	Stationery	78	39
2.	Accessories	110	55
3.	Electronics	115	57
4.	Clothes	88	44
5.	Other	55	28

**\*\*Note** – This was a question with checkbox option hence respondents could have more than one option checked

and hence the percentages may add up to more than 100%.

Discussion: The reason for collection of this data was to understand the buying patterns and current shopping trends of individual so that e-commerce companies could maintain adequate inventory of such items which can be supplied in time to the customer after it gets ordered.

As it can be seen from the data above that Electronics and Accessories are the categories which were purchased more hence it is imperative for the e-retailer to maintain inventory of items such as hard drives, USB drives, memory cards, head phones, laptop bags, laptop skins etc. This will help in fulfilling the demand of the customer as soon as the order arrives and these items do not take much space also to store hence the inventory carrying cost will be minimum.

A recent trend as it can be seen from the data above was respondents have also started purchasing clothes and stationery items online. Although there is not much cost involved in carrying inventory for stationery items but clothes and apparels do have some significant costs and challenges associated with it which is discussed in later parts of this report.

**Table 4: Products which are delivered in lesser time as per the customers**

<b>S. No</b>	<b>Category</b>	<b>Number of respondents</b>	<b>Percentage (%)</b>
1.	Stationery	73	37
2.	Accessories	70	35
3.	Electronics	101	51
4.	Clothes	41	21
5.	Other	31	16

\*\*Note – This was a question with checkbox option hence respondents could have more than one option checked and hence the percentages may add up to more than 100%.

Discussion: The data collected for this question seems to prove what was discussed in Table no. 3 above. As it can be seen from the data that respondents have chosen Electronics, Accessories and Stationery as the categories in which products were delivered in lesser time compared to others. This can be attributed to the fact that e-retailers maintain inventory of these items so that it can be shipped as soon as it were purchased. Maintaining inventory for these items was not a problem as they are fast selling and hence minimum inventory carrying cost was involved. Secondly, as discussed with executives of Yesgrid.com, they said that purchasing these products and maintaining

inventory of it gave a good margin to them and this helped them in offering discounts over such products.

Clothes seems to take a longer time for delivery as only 16% of the respondents said that they were delivered in less time. From this data it can be analyzed that consideration should be given to the products in the clothes and others category to understand the reason behind delay in shipping these types of products. It may happen that online retailers in the clothes category face the additional challenge of managing inventory information for several SKUs for each product because of the several sizes and colours of the products.

**Table 5: Expected time of delivery of products**

<b>S. No.</b>	<b>Expected Time</b>	<b>Number of respondents</b>	<b>Percentage (%)</b>
1.	Time as stipulated on the website	107	53.5
2.	Time lesser than as stipulated on the website	62	31
3.	Time greater than as stipulated on the website	20	10
4.	No expectations	11	5.5

Discussion: From the table given above, it can be interpreted that the majority of the respondents expected the delivery of the product which they purchased online to be as per the time stipulated on the website. While some of the respondents said that they expected to get products delivered in time lesser than as stipulated on the website. Hence keeping in mind these factors an online retailer should device mechanism to maintain inventory of the products such that delivery happens to the customers in time.

One of the surprising finding which can be made from the above data is that 10% of the respondents expect time greater than as stipulated on the website for delivery of products. This can be attributed to the fact that they may have had some bad experience and on basis of which they expect that the products never gets delivered on time as claimed by the online retailer. Online retailers should change this perception.

**Table 6: Parameters to judge the customer satisfaction level**

S. No	Parameters	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Complains most of the time when not delivered on time	27(14%)	70 (35%)	59 (30%)	43(22%)	1(1%)
2.	Complaints are resolved in time	12(6%)	83 (42%)	79 (40%)	24(12%)	2(1%)
3.	Keep track for delivery of product	4(2%)	47 (24%)	88 (44%)	53(27%)	8(4%)
4.	Not shopping again on the same website after bad experience of product delivery	37 (19%)	78 (39%)	58 (29%)	25(13%)	2(1%)

**Discussion:** From the data it can be inferred that most of the respondents agreed that they complained most of the times when the products are not delivered on time. While some of the respondents agreed that complains were resolved on time by the online retailer, most of them agreed that they would not like to shop again on the same website after a bad experience of product delivery. Considering these facts an online retailer should try to minimize the complaints and hence loss of sales and customers by ensuring to deliver the products on time. This is possible by having an effective an efficient inventory management system in place.

## 6. Hypothesis Testing

H1: Better inventory management increases the customer satisfaction level

Consider the following statistics

### Frequency distribution of Love for shopping online

	Frequency	Percent	Valid Percent	Cumulative Percent
1	1	.5	.5	.5
2	12	6.0	6.0	6.5
3	58	29.0	29.0	35.5
4	75	37.5	37.5	73.0
5	54	27.0	27.0	100.0
<b>Total</b>	<b>200</b>	<b>100.0</b>	<b>100.0</b>	

**Here, 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree**

1. Complaints from Customer when products are not delivered on time

Here, 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

2. Not shopping on the same website again

Here, 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

3. Regression statistics between complaints and not shopping again

**Regression Statistics**

<b>Multiple R</b>	0.425310298
<b>R Square</b>	0.180888849
<b>Adjusted R Square</b>	0.176751924
<b>Standard Error</b>	0.870933915
<b>Observations</b>	200

Based on the analysis of data gathered from 200 individuals it was found that there exists a relationship between customer satisfaction and inventory management of various products by online retailer.

As the numbers of people shopping online are increasing which can be seen from the mean score of 3.85 for love for shopping online of the respondents and most of them in the age group of 18-25 they expect better service and faster deliveries of products. It can be seen from a mean score of 3.93, most of the respondents complained when the products were not delivered on time and they would not shop again on the same website again if they had a bad experience with the delivery of products. This is indicated by a mean score of 3.66 above.

Also, the regression statistics above indicates that there is positive correlation of 0.4253 between complaints from customers when products were not delivered on time and they not shopping again on the same website after a bad experience of delivery of products.

Hence this proves the hypothesis that better inventory management increases the customer satisfaction level.

Therefore it is imperative to maintain good inventory of products and supply them in stipulated time increase the customer satisfaction levels.



## 7. Secondary Data Results And Analysis

### INVENTORY MANAGEMENT CHALLENGES

**DEMAND FLUCTUATION** – Most of the online retailers have to account for the demand fluctuations which are caused due to the seasonality and product popularity. For example, during the time when most of the schools re-open in India after the summer vacation, the online stationery retailers face a mammoth challenge to supply all the necessary items which a school going kid needs because this is the time when the demand will fluctuate more due to seasonality. Similarly for online apparel stores a particular product in fashion will cause the demand to fluctuate. Online retailers should equip themselves and be capable of handling all such situations by having a good foresight.

**REVERSE LOGISTICS** - Reverse logistics is one of the greatest challenges that online retailers have to manage to enhance the customer satisfaction and generate more business. Because of the challenge of high product returns, the management of reverse logistics is crucial for survival. Returned products have to be organized into distinct categories to see if they can be reused or distributed into smaller pieces to see if their components can be reused in different products.(Dr. Rell Snyder, 2009)

**STOCKOUTS** – Sometimes the online retailers carry lesser inventory to reduce cost and the benefits of carrying lower inventory are widely acknowledged also, but such a policy increases the risk of stockouts. Stockouts can negatively affect online retailers in many ways. Retailers who experience stockouts face declining sales and declining customer satisfaction, customers might switch to competitors and there would be more back end costs.(Dr. Rell Snyder, 2009)

**MANAGING SKU** – This challenge is mostly faced by the online apparel retailers where they have the problem of managing inventory information for various SKUs for each product shown on the website. This is mainly because each product can have several sizes and colours.(www.internetretailer.com)

**5.MULTI CHANNEL SHOPPERS** - Inventory control is more challenging than ever because of the evolution of customers into multichannel shoppers. Consumers now browse, research, purchase and return products through multiple mediums. For example:

- ☐ Buy online and ship to home
- ☐ Buy online and pick up or return in store

(White Paper from Exel: North American company in SCM)

### MANAGING THE RISKS

Following are some of the risk mitigating strategies for Inventory management by online retailers:(Damien

Tampling, Deloitte, 2011)

- Pre-purchase stock - If the retailer has efficient inventory management, customers are happy because the products they want to purchase are known to be available and in turn delivered quickly. On the other hand, the retailer takes on all the inventory risk
- Take stock after customers buy it - This limits inventory risk, but can lead to slightly longer delivery times. This model does however mean closer working ties with suppliers in that the online retailer need to work with them on an almost daily basis to ensure supply can meet likely demand.

Two additional models online retailers use are:

- Drop-shipping - The retailer doesn't hold inventory and acts as a shopfront for other suppliers and retailers who are responsible for fulfilling orders. Many e-commerce companies in the dot com era tried to take advantage of holding no inventory by outsourcing their inventory management process to focus on front-end activities.
- Hybrid –In this particular strategy the online retailer only holds stock of regularly ordered items, ensuring these are delivered quickly, while reducing the inventory risk on infrequently sold items. The ideal situation for retailers is to always use the hybrid strategy because of the risk reduction that occurs by having a safety stock at some other location.

## 8. Conclusion And Recommendation

In the light of the objective it can be concluded that managing inventory for an online e-commerce B2C business is as important or crucial as maintaining a glamorous and beautiful user friendly website.

A B2C E-commerce company faces many inventory management challenges such as demand fluctuations which can be caused due to seasonality or product popularity, reverse logistics, stockouts and many more. Due to these challenges an online retailer faces greater risk of loss of sales and loss of customers. Hence it is very important for an online retailer to be aware of these challenges and risks and mitigate the same with the help of proper strategies such as drop ship or hybrid. This will protect the online retailer from various risks and at the same time will also enhance the levels of customer satisfaction.

Some of the recommendations for better inventory management for online retailers are:

- Being Organized: This is about knowing what we have and where to find it. One of the basic concepts of inventory management is being organized
- Avoid being out of stock: If something is displayed on the website and is shown as in stock then online retailer should make sure that the particular item is available. It's a big disappointment for customers when they see out of stock notices.
- Select a particular system or strategy as discussed above to manage inventory

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